

REMARKS

I. Status Summary

Claims 1-14 are pending in the present application. Claims 1 and 7 have been amended. Therefore, upon entry of this Amendment, Claims 1-14 will be pending. No new matter has been introduced by the present amendment. Reconsideration of the application as amended and based on the arguments set forth hereinbelow is respectfully requested.

II. Claim Rejections under 35 U.S.C. § 102

Claims 1, 2, 8, 9, and 12-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,327,337 to Cripe (hereinafter, "Cripe"). Further, Claims 1, 3, 9, and 11-14 stand rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent Application Publication No. 2003/0095000 to Ramage et al. (hereinafter, "Ramage"). These rejections are respectfully traversed.

II.A. Rejection of Claims 1, 2, 8, 9, and 12-14 Based Upon Cripe

Claim 1 recites a line driver arrangement comprising a class-D switching amplifier having a switching frequency. Further, Claim 1 recites that the class-D amplifier receives an input transmit signal and outputs an amplified transmit signal. Claim 1 also recites a transformer having a predetermined leakage inductance for receiving the amplified transmit signal and outputting a transformed signal as an output transmit signal. Further, Claim 1 recites that the leakage inductance is predetermined for low pass filtering of the amplified transmit signal. Summarily, Cripe does not teach the Claim 1 features of a line driver arrangement comprising: (1) a class-D switching

amplifier; and (2) receiving an amplified transmit signal and outputting a transformed signal as an output transmit signal.

Cripe is directed to a class-E resonant push-pull power amplifier. (Cripe, column 1, lines 55-50). Class-E amplifiers are switching power amplifiers having switches that are periodically opened and closed at the operational frequency. For example, referring to Figure 1 of Cripe, a class-E amplifier is shown including switches **Q1** and **Q2** which are driven at a nominal 50% duty. (Cripe, column 2, line 67, to column 3, line 4). Further, Cripe discloses that class-E amplifiers require an RF choke having a comparatively large inductance that effectively functions as a constant current source. (Cripe, column 3, lines 10-20).

Further, regarding class-E amplifiers, passive devices, such as capacitors and coils, are included to achieve the following two conditions: (1) the voltage across the switch at the time of closing is zero; and (2) the time derivative of voltage across the switch is zero. As a result of these conditions, in class-E amplifiers, a resonance circuit having a resonance frequency at the frequency of operation of the class-E amplifier is created. (Cripe, column 2, lines 22-27).

In contrast to the class-E amplifier disclosed by Cripe, Claim 1 requires a class-D switching amplifier. An example of a class-D switching amplifier is shown in Figure 3 of the present application. The class-D switching amplifier is operated with pulse-width modulated signals having variable duty cycles. (Application, page 4, lines 13-26). The class-D switching amplifier features required by Claim 1 are not taught by Cripe. Further, Cripe distinguishes class-E amplifiers from class-D switching amplifiers in its Background section. (Cripe, column 1, lines 36-41). Because Cripe fails to describe a

line driver arrangement comprising a class-D switching amplifier as required by Claim 1, the reference fails to disclose each and every feature required by Claim 1. Therefore, Cripe does not anticipate the subject matter recited by Claim 1.

Further, Cripe fails to disclose a transformer having a predetermined leakage inductance as required by Claim 1. A coupling transformer **T1** shown in Figure 1 of Cripe is the only transformer taught by the reference. Transformer **T1** includes a center tap in its primary winding. (Cripe, column 3, lines 10-13). The center tap of transformer **T1** is connected to a circuit power source **+Vcc**. (Cripe, column 3, lines 12 and 13). The connection to circuit power source **+Vcc** can be provided through an RF choke **L1**, which is necessary in class-E amplifiers. (Cripe, column 3, lines 13-16). RF choke **L1** is a discrete circuit element, a coil for example, and does not correspond with any type of leakage inductance associated with transformer **T1**. Cripe provides no disclosure of a transformer having a predetermined leakage inductance as required by Claim 1. Therefore, for this additional reason, Cripe fails to disclose each and every feature required by Claim 1.

Claims 2, 8, 9, and 12 depend from Claim 1. Therefore, the comments presented above relating to Claim 1 apply equally to Claims 2, 8, 9, and 12. Further, dependent Claims 2, 8, 9, and 12 include additional features that are not taught by Cripe. For example, Cripe fails to disclose predetermining a leakage inductance to minimize a resonance as required by dependent Claim 2. Rather, Cripe teaches creating a resonance circuit made of the coupling transformer **T1** and that the load is coupled to the secondary winding of the transformer. (Cripe, column 2, lines 26-28).

Further, regarding dependent Claim 8, for example, Cripe fails to disclose a transformer having stray capacitances. Rather, Cripe teaches switching means (**Q1** and **Q2**) having associated shunt capacitances **C1** and **C2**. (Cripe, column 3, lines 41-44).

Regarding dependent Claim 12, for example, Cripe does not disclose additional resistances or inductances being a part of a line driver circuit as required by the claim. Rather, in Cripe, components **R1**, **L2**, and **C3** are forming the load coupled to the arrangement. (Cripe, column 3, lines 53 and 54). These elements are not part of the line driver.

In summary, for the reasons set forth above, applicants respectfully submit that Cripe does not teach each and every feature of the present subject matter, and therefore that Claims 1, 2, 8, 9, and 12 are not anticipated by Cripe. Applicants, therefore, respectfully requests that the rejection of Claims 1, 2, 8, 9, and 12 under 35 U.S.C. § 102(b) as being anticipated by Cripe be withdrawn and the claims allowed at this time.

Claim 13 recites a transformer for use in a line driver arrangement. Further, Claim 13 recites that the line driver arrangement comprises an amplifier for receiving an input transmit signal and outputting an amplified transmit signal. Claim 13 also recites that the transformer has a predetermined leakage inductance and/or stray capacitance. Further, Claim 13 recites that the leakage inductance and/or stray capacitance is predetermined for low pass filtering of the amplified transmit signal. Summarily, Cripe does not teach a transformer having a predetermined leakage inductance as required by Claim 13.

As stated above, Cripe does not teach a transformer having a predetermined leakage inductance, as required by Claim 1. Claim 13 requires a similar feature. Therefore, for the reasons set forth above, it is respectfully submitted that Cripe does not teach the predetermined leakage inductance feature recited by Claim 13, and therefore that Claim 13 and dependent Claim 14 are not anticipated by the cited reference. Applicants, therefore, respectfully request that the rejection of Claims 13 and 14 under 35 U.S.C. § 102(b) as being anticipated by Cripe also be withdrawn and the claims allowed at this time.

II.B. Rejection of Claims 1, 3, 9, and 11-14 Based Upon Ramage

Ramage is directed to a power amplifier for use in audio applications. Summarily, Ramage fails to disclose the Claim 1 features of (1) a line driver arrangement comprising a transformer having a predetermined leakage inductance for receiving an amplified transmit signal and outputting a transformed signal as an output transmit signal; and (2) wherein the leakage is predetermined for low pass filtering of an amplified transmit signal. The Examiner stated that the line driver arrangement of Claim 1 is disclosed by Figure 1 of Ramage. Referring to Figure 1, a transformer 30 is impedance matched to an acoustic transducer system (i.e., a loudspeaker). (Ramage, paragraph 31). The low-pass filtering disclosed by Ramage is achieved by circuitry components 22, 26, 23, and 27. (Ramage, paragraph 30). Filters 22 and 23 of Figure 1 do not relate to transformer 30 as to the functions of receiving an amplified transmit signal and outputting a transformed signal. Instead, filters 22 and 23 relate to power factor correction circuitry as indicated by PFC modules 24 and 25. (Ramage, paragraph

30). Ramage teaches low-pass filtering after the power amplifier is achieved by additional low-pass filters. (Ramage, paragraph 39). Thus, Ramage neither discloses a transformer having a predetermined leakage inductance nor a leakage inductance being predetermined for low-pass filtering, as required by Claim 1.

Claims 3, 9, 11, and 12 depend from Claim 1. Therefore, the comments presented above relating to Claim 1 apply equally to Claims 3, 9, 11, and 12.

For the reasons set forth above, applicants respectfully submit that Ramage does not teach each and every feature of the present subject matter, and therefore that Claims 1, 3, 9, 11, and 12 are not anticipated by Ramage. Applicants, therefore, respectfully requests that the rejection of Claims 1, 3, 9, 11, and 12 under 35 U.S.C. § 102(a) as being anticipated by Ramage be withdrawn and the claims allowed at this time.

As stated above, Ramage does not teach a transformer having a predetermined leakage inductance, as required by Claim 1. Claim 13 requires similar features. Therefore, for the reasons set forth above, it is respectfully submitted that Ramage does not teach the predetermined leakage inductance feature required by Claim 13. Claim 14 depends upon Claim 13. Therefore, it is respectfully submitted that Claim 13 and dependent Claim 14 are not anticipated by Ramage. Applicants, therefore, respectfully request that the rejection of Claims 13 and 14 under 35 U.S.C. § 102(a) as being anticipated by Ramage be withdrawn and the claims allowed at this time.

III. Claim Rejections Under 35 U.S.C. § 103

Claims 4 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ramage, as applied to Claims 1 and 3 above, and further in view of Applicants' Admitted Prior Art (hereinafter, "AAPA"). Further, Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ramage, as applied to Claim 1, and further in view of U.S. Patent No. 6,091,206 to Siao (hereinafter, "Siao"). Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ramage, modified by Siao as applied to Claim 5, and further in view of U.S. Patent Application Publication No. 2003/0042801 to Miyajima et al. (hereinafter, "Miyajima"). These rejections are respectfully traversed.

III.A. Rejection of Claims 4 and 10 Based Upon Ramage and AAPA

Claims 4 and 10 depend upon Claim 1. Therefore, Claims 4 and 10 include the features of Claim 1. As set forth above, Ramage does not teach the Claim 1 features of a transformer having a predetermined leakage inductance nor a leakage inductance being predetermined for low-pass filtering. In addition, applicants respectfully submit that Ramage does not suggest these features of Claim 1. AAPA fails to overcome the significant shortcomings of Ramage.

Referring to the Official Action, the Examiner stated that AAPA discloses a line driver arrangement utilizing class-D power amplifiers having a power spectral density that complies with ADSL standards. (Official Action, page 5). In contrast, dependent Claims 4 and 10 require the features of a transformer having a predetermined leakage inductance and a leakage inductance being predetermined for low-pass filtering. AAPA

does not disclose or suggest a transformer having a predetermined leakage inductance or a leakage inductance being predetermined for low-pass filtering, as required by Claims 4 and 10.

For the reasons provided above with respect to Claims 4 and 10, applicants respectfully submit that the teachings of Ramage and AAPA cannot be combined to either teach or suggest each and every element required by Claims 4 and 10, and therefore, that Claims 4 and 10 are not obvious in view of the cited references. Applicants, therefore, respectfully request that the rejection of Claims 4 and 10 under 35 U.S.C. §103(a) be withdrawn and the claims allowed at this time.

III.B. Rejection of Claims 5 and 6 Based Upon Ramage and Siao

Claims 5 and 6 depend from Claim 1. As set forth above, Ramage does not teach the Claim 1 features of a transformer having a predetermined leakage inductance nor a leakage inductance being predetermined for low-pass filtering. In addition, applicants respectfully submit that Ramage does not suggest these Claim 1 features. Siao fails to overcome the significant shortcomings of Ramage.

Siao is directed to an electronic ballast system for fluorescent lamps. The ballast system disclosed by Siao includes a transformer **11**, a power oscillator **12** connected to the primary of the transformer, and a ballasting network **13** connected to the secondary of the transformer. (Siao, column 2, lines 28-32). Further, Siao discloses that power oscillator **12** is a class-D power oscillator. (Siao, column 2, lines 52-55). Various discrete circuit elements are used to achieve a resonating network at a frequency close to a predetermined frequency range. (Siao, column 1, lines 53-55, and column 2, line

64, to column 3, line 5). Siao does not disclose or suggest a transformer having a predetermined leakage inductance nor a leakage inductance being predetermined for low-pass filtering, as required by Claims 5 and 6.

For the reasons provided above with respect to Claims 5 and 6, applicants respectfully submit that the teachings of Ramage and Siao cannot be combined to either teach or suggest each and every element required by Claims 5 and 6, and therefore, that Claims 5 and 6 are not obvious in view of the cited references. Applicants, therefore, respectfully request that the rejection of Claims 5 and 6 under 35 U.S.C. §103(a) be withdrawn and the claims allowed at this time.

III.C. Rejection of Claim 7 Based Upon Ramage, Siao, and Miyajima

Claim 7 depends from Claim 1. Therefore, Claim 7 includes the features of Claim 1. As set forth above, neither Ramage nor Siao alone or in combination discloses or suggests a transformer having a predetermined leakage inductance nor a leakage inductance being predetermined for low-pass filtering, as required by Claim 7. Miyajima fails to overcome the significant shortcomings of Ramage and Siao.

Miyajima is directed to an electromagnetic drive type actuator. As stated by the Examiner, Miyajima discloses a low pass filter having a cutoff frequency that is lower than the resonance frequency. (Miyajima, paragraph 109). However, Miyajima fails to disclose or suggest a transformer having a predetermined leakage inductance and a leakage inductance being predetermined for low-pass filtering, as required by Claim 7.

For the reasons provided above with respect to Claim 7, applicants respectfully submit that the teachings of Ramage, Siao, and Miyajima cannot be combined to either

teach or suggest each and every element required by Claim 7, and therefore, that Claim 7 is not obvious in view of the cited references. Applicants, therefore, respectfully request that the rejection of Claim 7 under 35 U.S.C. §103(a) be withdrawn and the claim allowed at this time.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

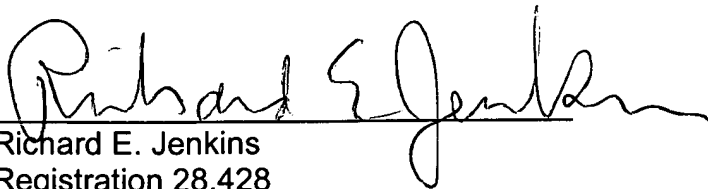
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Respectfully submitted,

JENKINS, WILSON & TAYLOR, P.A.

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